

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 February 2005 (24.02.2005)

PCT

(10) International Publication Number
WO 2005/016993 A1

(51) International Patent Classification⁷: **C08G 71/04**,
C08K 7/04, 9/04

(21) International Application Number:
PCT/EP2004/051796

(22) International Filing Date: 13 August 2004 (13.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03255011.3 13 August 2003 (13.08.2003) EP

(71) Applicant (for all designated States except US): **HUNTS-
MAN ADVANCED MATERIALS (SWITZERLAND)**
GMBH [CH/CH]; Klybeckstrasse 200, CH-4057 Basel
(CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DIAKOUMAKOS**,
Constantinos, D. [GR/GB]; 12 Crossways House, Anstey
Way, Trumpington, Cambridge CB2 2JZ (GB). **KOTZEV**,
Dimitar, Lubomirov [GB/GB]; 21 Carron Close, Corby,
Northants.NN1 2LB.(GB).

(74) Agents: **BARUH**, Colette et al.; Huntsman (Europe)
BVBA, Intellectual Property Department, Everslaan 45,
B-3078 Everberg (BE).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: **NANOCOMPOSITES BASED ON POLYURETHANE OR POLYURETHANE-EPOXY HYBRID RESINS
PREPARED AVOIDING ISOCYANATES**

(57) Abstract: A fast curable non-isocyanate-based polyurethane- and polyurethane-epoxy network nanocomposite polymeric com-
positions are derived upon crosslinking a mixture comprising of natural or modified nano-clay [ionic phyllosilicate] with platelet
thickness in the scale of A (~1 nm) and aspect ratio (length/thickness) higher than 10 (nm)] preferably natural or modified montmo-
rillonite with either a monomer(s) or oligomer(s) bearing at least one cyclocarbonate group or a mixture of the latter with an epoxy
resin, with a hardener, which is a monomer or oligomer or mixtures therefrom, bearing primary and/or secondary amino groups. The
use of the nanoclays reduces the gel time and increases the adhesion of the cured polyurethane and polyurethane/epoxy hybrid and
also reduces its water absorption.

WO 2005/016993 A1